Project Managers' Advisory Group

MINUTES
August 15, 2011

Attending: **(* = by phone)**

Bob Giannuzzi	EPMO
Kathy Bromead	EPMO
Jesus Lopez*	EPMO
Gaye Mays	EPMO
John O'Shaughnessy*	ITS
Janet Stewart*	ITS
Todd Russ*	ITS
Lucy Cornelius*	DPI
Cheryl Ritter*	DOT
Vicky Kumar*	OSC
Ellen Zimmerman*	DHHS DPH
Barbara Swartz*	DHHS DPH
Gary Lapio*	DHHS DIRM
Lynne Beck*	DMH/DD/SAS
Sara Liles*	DMH/DD/SAS
Larry Sanders*	ESC
Jodi Bone*	ESC
Lloyd Slominsky*	Dept. of Corrections
Colleen McCarthy*	SOS
Chris Cline*	NCCCS

Bob Giannuzzi welcomed everyone to the meeting. There were no first time attendees.

Bob solicited and received approval of the July minutes.

Jesus Lopez recognized three new PMPs: Stan McIntyre (DOT), Mimi Bennett (UNC), and Anita Collins (UNC). Each will receive a congratulatory letter from the SCIO, Jerry Fralick.

Jesus advised that the results of the PMP Exam Prep class survey were quite favorable as in the past. He'll summarize the data and share with the group.

Bob reported that NASCIO has announced the finalists for the 2011 NASCIO Recognition Awards for Outstanding Achievement in the Field of Information Technology in State Government. To ensure members can access the innovations and best practices of their peers, details about all the nominated projects are posted on NASCIO's website at www.nascio.org/awards. North Carolina has finalists in two categories:

Digital Government: Government to Citizen
State of North Carolina – North Carolina State Parks Central Reservation System

Open Government Initiatives
State of North Carolina – E-mail and Open Government

Bob compiled the following upcoming PDU opportunities through NCPMI:

Venue	Speaker	Date/Topic
Annual Event		Oct 19 (8:15 am)
General Membership	Kavita Gupta	Aug 25 (6:00 PM) Creating Your Own Communication Road Map In Our Environment
Public Sector LIG		No meeting scheduled
PMO Committee	Bill Blevins	Aug 24 (5:45 PM) Evolution of the PMO – Organizational Value as a Measure of Maturity
Leadership Committee		No meeting scheduled
Information Systems Committee	Geri Adams	Aug 15 (5:30 PM) Preparing for your next opportunity

The progress of the EPMO work groups was discussed next.

- **SDLC** to address integration of alternate SDLCs (e.g., Agile) into the current process/workflow. Gaye Mays reported that the group agreed on an Agile workflow and is looking for a project to pilot it. At its September meeting, the group will focus on simplifying the workflow for hardware/infrastructure projects.
- **Agency Procurement** to develop a common (within agency) procurement process. Kathy advised that the group updated its charter to include its next steps. Work on the RFP process of evaluation planning and scoring continues.
- **Business Case** to develop guidelines and provide training on justifying projects based on cost/benefits analysis. Bob reported that the group is working on refining the cost/benefits template. They are looking for volunteers to test the template fro their projects.

Lucy Cornelius reported on Methodology Task Group activity. The group is continuing the development of a template to itemize and describe project Business Functional Requirements.

This year's EPMO customer survey has been sent out to PPM licensees and CIOs. Gaye advised that 19 had been submitted to date and that the survey may be passed on to others who may be interested in participating. At the meeting, Kathy originally agreed to post the link on the EPMO website, but later decided not to.

Kathy reminded the group of the 9/2 deadline for APM entry. Training sessions are winding down.

As a best practice, Lucy discussed Organizational Transition artifacts she has used. The files will be sent out with these minutes.

John O'Shaughnessy shared some key Lessons Learned from a number of IT Consolidation projects he's worked on. Lessons Learned from recently closed/canceled projects are summarized in the Appendix below.

Meeting adjourned at 4:00 PM.

NEXT MEETING

Monday, September 19, 2011 at 3:30
333 Six Forks Road Conference Room 5 or (919) 981-5581

https://its.ncgovconnect.com/r96139571/

APPENDIX

Lessons Learned Documentation

Exhibit A

Department of Commerce - Buildings and Sites Redesign

Initiation Phase:

Topic	Lessons Learned
1. Business Case / Project Charter	We had a very clear business case and a well-written Project Charter. We articulated the business case through the (at the time) the Cross Functional/Portfolio Management group at Commerce with full support of senior management and were able to use this garner funding at the legislature and additional internal funding. As always, writing the Project Charter was an important exercise that helped us clearly think through the roles and the team makeup associated with the project. We had all parties involved sign the charter and commit to making the project successful.
2. Level 1 Budget	One aspect of the initiation phase was the procurement plan and acquisition approach. As part of the procurement plan we identified the planning phase need to be sole sourced as this was building on the complex technologies of the EDIS product. By sole sourcing we were able to make certain that we had accurate and achievable estimates for the planning and design phase.
3. Benefits	We did some work on estimating benefits that was based on extending EDIS. Although the benefit estimates were helpful to obtain management support, in economic development this is essentially a must and can almost be viewed as a force-funded solution. The benefits were conservative and appear to be exceeding the original benefit estimates.

4. Procurement Plan (procurement strategy….build vs. buy)	We did a lot of research and came to the right conclusion that this was needed to be a sole sourced solution as it was an additional phase of the EDIS application and where we had a lot of unique functions that were developed by the EDIS vendor's R&D shop. We did have some confusion during this identification process internally between the CIO and the DOC Procurement Office that did delay the sourcing by a several weeks. The Project Manager and Product Manager facilitated a meeting with OITS Procurement Director to gain approval for the sole source plan.
5. Project Approval Process	No problems with the project approval process at this phase of the implementation.
6. Managing Sponsor Expectations	Sponsor expectations were well-managed during this phase. The sponsor understood the budget estimates and the time estimates of staff. We did have changing sponsors as the governor appointed new staff and we amended the charter appropriately and had the new sponsor commit to the engagement.
7. Managing Customer Expectations	We communicated well to our internal and external customers about the expectations of the project. Obtaining support from customers was not difficult as this additional EDIS product supports them directly, saving them money and assisting in promoting their communities.
8. Other	While the project approval process was not very difficult, getting approval to issue the sole source contract was not smooth. It took much longer than expected and disconnect seemed to exist between the OITS Procurement Office and the Department of Commerce Procurement Office. This was a very clear sole source justification and the review process was far too long for very little questions related to the justification. The procurement process seem to not be clear at times and can be a frustrating process when trying build accurate schedules and communicating with the customers who's organizations are not burdened with the State policies when making smart business decisions.

Planning & Design Phase:

Topic	Lessons Learned
1. Updated Business Case	The detailed sessions with our stakeholders only further strengthened the business case and justification for this project.
2. Updated Budget	We updated the budget prior to entering into Execution and Build based on the detailed requirements and designs developed in the Planning Phase. We did a great job negotiating the costs for the project and had no vendor overruns even with some significant challenges that put the project at risk early in the Execution and Build Phase.
3. Updated Procurement Plan	Procurement was handled in a two phased approach. We did a sole source contract for the Planning and Design Phase and then once completed amended the contract to sole source the Execution and Build/Implementation Phase activities.
4. Project Approval Process	No problems with the project approval process at this phase of the implementation.
5. Managing Sponsor Expectations	Sponsor expectations were well-managed during this phase.
6. Managing Customer Expectations	We did an excellent job of communicating, obtaining input, and designing a system that met the majority of the clients' expectations. The external requirements gathering sessions around the state provided our stakeholders with the insight of what we were looking to accomplish and provided us a platform to gather all of the requirements for the system. We also revalidated the design with a subset of the larger group of stakeholders and vetted that to obtain full support o f the community.
7. Risk Management	We did a good job managing risks during this phase of the project. The Core Project Team communicated and documented the risks well during the engagement and established mitigation plans for each risk.
8. Issue Management	This was a complex project and the Core Project Team did a good job of reviewing issues and responding to those issues.
9. Monthly Status Reporting	During this phase of the engagement we provided status reports on time to OITS and remained green overall. The weekly status report/meeting with the vendor and the weekly meetings with the Core Project Team helped facilitate a successful Planning and Design Phase.
10. Staffing Plan	Like we have done for other major cross-functional projects in the Department, we developed a Core Project Team that consisted of representatives from key

	constituencies in the Department. The Core Project Team was central to the success of the project. To take it a step further, the members of this team shared the same commitment to the project and supported each other during the entire project. This team shared not only the commitment, but also shared the responsibility. This team was the biggest success of the project and would be a great to reassemble for future projects.
11. Project Schedule / Milestones / Project Planning	The vendor met the deadlines for all activities of this phase of the project. Having the vendor working with us during the planning and design phase was a very positive experience and we had a common understating of the requirements and business functions of the system. We hit all of our milestones at this phase of the project and we had not major impacts to the schedule.
12. ETS System Design Document	Nothing good to be sad here for any phase of the engagement. At this stage of the project we were building upon the investments made with the EDIS system and building this additional component onto the EDIS application in the SAS Shared Service Environment. The SAS Shared Service Environment architecture was already approved, but very complex. We submitted an updated design with the additional components we had outside of the Shared Service Environment and referenced those components of the shared service environment and we were given a hard time. We had to figure out how to incorporate the Shared Service Environment into our design and it seemed the architectural team had more issues with that piece of the architecture that was already approved and operational. This team also would not share a model TASD for us to review as a best practice and the leadership of this team was not customer focused throughout the engagement. Big room for improvement.
13. Requirements Mapping	The requirements mapping and the ensuing design were clearly understood by all parties involved. The design could easily be mapped to each requirement and was clear as the vendor participated in each requirements session with the stakeholders.
14. Other	An important aspect of this phase of the project was that the vendor was able to obtain an understanding of the economic development world and exactly how a customer would use this system. The stakeholders also had interactions with the vendor and provided a level of confidence that this project was headed toward success.

Execution & Build Phase:

Topic	Lessons Learned
1. Updated Procurement plan	No updates the procurement plan, this phase was sole sourced coming out of Planning and Design.
2. Project Approval Process	Project approval process was not well executed in entering the Implementation Phase. This gate approval for Implementation was rejected by Architecture lead based on environment security gaps, which then he approved. This environment was designed by ITS Engineering in coordination with Commerce. This rejection was unwarranted and the communications of why it was rejected was not professional.
3. Managing Sponsor Expectations	Project sponsor changed during this phase of the project. We sat down with the sponsor and reviewed and modified the charter and had him sign and commit to supporting this engagement.
4. Managing Customer Expectations	As a whole, this was a very successful part of this project and we did have some room for improvement in the rollout of the training. We had several webex's, established a listserve, and had several meetings where we reviewed the pieces/functions of the system as they were being developed. We also went around the state presenting to the various stakeholders and user groups to prepare them for the system.
5. Risk Management	The Core Project Team did a great job of managing risks.
6. Issue Management	The Core Project Team did a great job of managing issues.
7. Monthly Status Reporting	The project overall remained green throughout this engagement, but we did not report every month in a timely fashion and we should look to improve reporting in the future.
8. Project Schedule / Milestones / Project Planning	Even though we did not hit the baseline schedule we did a tremendous job delivering given the fact that ITS shutdown the SAS Shared Service that we were

	developing the application within during the Execution and Build Phase activities. This was a major change to the engagement as we did not have an immediate alternative solution to move the development activities and had to change the design of the system and redo the TASD. It should be noted that we were able to accomplish this at no additional costs to Commerce or to this contract. This was a major failure on the part of ITS to not communicate through the SAS Shared Service Advisory Team and to call me into a meeting without warning and close the service. ITS did not review the true impact to customers and those contracts that had specifically identified that had contracts that required use of the Shared Service. This was a major disappointment after we had been forced into the Shared Service by ITS leadership.
9. Resource Management (internal & external resources)	Because of schedule changes and focusing on establishing a completely new environment we had to invest more internal hours and at times lose our focus on the product development and invest more hours on the issues with ITS environment with the same amount of staff. This was outside of Commerce's control. We successfully managed the vendor and vendor resources and we did not have any cost overruns during this engagement with the vendor. Commerce did a great job managing this to delivery and even though the vendor was out of hours 6 months prior to delivery; they worked on it to completion at no additional charge to the State of NC and its citizens. I would say this also demonstrates a commitment by the vendor and a true partnership.
10. Vendor Management / Vendor Performance / Vendor Deliverables	As the schedule started getting off track due to the SAS Shared Service closure, the vendor had to turn their attention to establishing a development and test environment in-house and this derailed activities. We then had to crash the schedule to make up for lost time and project management practices with the vendor became lax and the vendor started applying more resources, but also started to change the resources. Although the vendor delivered the application, the resources we had confidence with and started out with were shifted to other engagement or left the company and at time we were working with more junior level developers. We had established a project plan that had an iterative testing component and at times the products/functions we were testing did not adequately undergo unit testing. It was obvious we were wasting our time testing functions and applications that had not been tested to the standards we expect and it wasted a lot of Commerce manpower and in the end the vendor resources as well. Also because of the changing resources, the vendor did not work onsite as much as agreed upon, so we did not do as much joint application development as anticipated.
11. Project Communication	Addressed above, this was a key success to the project.
12. Change Management / Change Request	Change management was handled both formally and informally. Because we didn't have any cost overruns we did not have to fully implement our change management plan, but we did review every change with the vendor and impacts to schedule, technical, and costs.
13. SLA Development (service level agreement)	As it pertains to ITS, the costs associated with a new environment and even the recommendations were not clear. ITS pushed the Virtual environment, even when we were requesting cost estimates for stand-alone servers. ITS is a vendor to this initiative and from that perspective, we didn't receive the service we wanted when obtaining clear specific costs. This was a real frustration to me as a product owner that it took long to get concrete answers from ITS and the process for obtaining a one cost spreadsheet for an application is not standard practice. Currently we are still working on obtaining credits for overcharging the Department. That being said, we don't feel it was the people at ITS, but rather the process that was amiss. When target dates on establishing the environment appeared in jeopardy, the ITS personnel organized and made our project a priority.
14. Pilot	We tested the components as they were developed and then performed an integrated testing once the application was migration to its final environment. We shared the product with a select group of stakeholders to use the system and provide us feedback. The testing and piloting of those results was an iterative process.
15. Development / Build	We ended up with a high quality product but do have some challenges managing a couple different applications within the project that were developed in different programming languages, Java and Flex. The vendor delivered a good solution, but

	the different programs did not do the same quality work and or code documentation.
16. Testing (test execution, verification & validation, test scripts, test cases)	We had an iterative approach to testing as described above. We tested components along the way and provided feedback based on the results of those tests. We have all Core Project Team members test and some external stakeholders test outside of the organization various components. We also worked with the SQA team to develop scripts and do performance testing and shared those results.
17. Requirements Verification & Validation	We validated that the requirement were at least met and renegotiated those requirements when we discovered a better solution through testing and or were no longer valid. Some requirements we adjusted and or dropped in favor of new requirements and or enhanced features not initially identified.
18. Hosting Provider (setting up environments)	As it pertains to ITS, the costs associated with a new environment and even the recommendations were not clear. ITS pushed the Virtual environment, even when we were requesting cost estimates for stand-alone servers. ITS is a vendor to this initiative and from that perspective, we didn't receive the service we wanted when obtaining clear specific costs. This was a real frustration to me as a product owner that it took long to get concrete answers from ITS and the process for obtaining a one cost spreadsheet for an application is not standard practice. Currently we are still working on obtaining credits for overcharging the Department. That being said, we don't feel it was the people at ITS, but rather the process that was amiss. When target dates on establishing the environment appeared in jeopardy, the ITS personnel organized and made our project a priority.
19. Backup / DR Strategy	We are satisfied with the backup/DR strategy employed under agreement with ITS.
20. Other	The delivery exceeds the expectations in reporting, searching, and in particular the map feature integration. We are a bit less satisfied with the data entry side of the system and the vendor definitely underestimated that effort.

Implementation Phase:

Topic	Lessons Learned
1. Updated Business Case	We did not update the business case for this phase.
2. Project Approval Process	The approval process was not smooth due to Architectures initial rejection based on security issues, which they then decided weren't issues, but took several weeks and too many taxpayer hours to come to this conclusion.
3. Managing Sponsor Expectations	We have continued to manage the sponsor's expectations. We have an executive sponsor that won't be necessarily utilizing the product, but the comments by Commerce stakeholders exceed sponsors expectations.
4. Managing Customer Expectations	We continue to exceed most customer expectations and people are using the product. In the month of March alone, we supported 10,980 unique visitors with this application. This is more than twice as many unique visitors to Commerce's main site www.nccommerce.com This is hugely successful. For those folks performing data entry it can be troublesome at times and a bit complex for less computer savvy users.
5. Risk Management	Core project team managed risks very well and the list of risks at this point of the project were minimal.
6. Issue Management	Core project team managed issues very well and the list of risks at this point of the project were minimal.
7. Monthly Status Reporting	For the PPM tool reporting we were late on status reports, primarily due to Architectures delays in review of security risks.
8. Project Schedule / Milestones / Project Planning	Implementation Phase was significantly shorter and less costly as planned. Most Implementation Phase activities were done in unison with the Execution and Build Phase activities. It would be naïve to assume all projects take a waterfall approach as laid out in the project process.
9. Resource Management (internal & external resources)	No major items to note here.
10. Vendor Management / Vendor Performance / Vendor Deliverables	No vendor hours were spent in the Implementation Phase of this initiative.

11. Project Deliverables (refer to the list of deliverables in the PPM Tool that the PM said would be delivered)	We delivered all product and project deliverables as outlined in the PPM throughout this project.
12. Project Cost vs. Budget Cost	For the entire project we did not have any vendor cost overruns and we had 3.5% cost increase for internal resources.
13. Change Management / Change Request	There was no official change management process for this project.
14. Implementation of Backup / DR	We are satisfied with the backup/DR strategy employed by the vendor and we understand how we can get our data back if we ever chose to do so.
15. Implementation of SLA	See comments above.
16. Hosting Provider	See comments above.
17. Production Readiness (software / hardware, process, personnel)	Although we did a great job setting up computer training throughout the state leveraging community college facilities and other business technology training centers, we scheduled the training probably a month earlier than we would have liked. The training sessions were a big hit and we have since followed up in each economic development region with additional training opportunities. This allow us to achieve an understand and readiness of our stakeholders to use the system. We unveiled the system in 2 stages, those that need to perform data entry and then to the full public. This approach worked will and the stakeholders were appreciative of us coming to them and performed structured computer based training. It also allowed us to reconnect with our users so they were more willing to call and discuss issues and resolve questions.
18. Training (user, admin, etc)	Please see production readiness, but I will also respond to the administrative aspect of the system. The Department of Commerce EDIS Team has the technical expertise to manage this system with solid experience in Flex, Java, GIS, and SAS technologies. That being said, we put the bulk of the vendor administrative training hours toward the Execution and Build Phase activities. The vendor team has been responsive when questions related to the system arise. We would have liked to have committed more hours to training so that modifications and changes would not be as significant tasks as they currently are.

General Comments:

Topic	Lessons Learned
1. Overall	Great Core Project team. Made the right choice of vendor and procurement strategies. We had great communication internally and externally with stakeholders. We were able to deliver on all the committed features and system components. We have more usage then we initially anticipated and it is widely used throughout the world to promote NC's communities and the State itself. We accomplished our goals and we already begun identifying new goals to achieve as this system constantly changes and matures.

Exhibit B

ITS - CGIA-NC Statewide Orthoimagery 2010

Initiation Phase:

Topic	Lessons Learned
1. Business Case / Project Charter	This was CGIA's first use of the Project Charter and was developed after a grant was awarded to CGIA's client. The business case stated in the grant proposal formed the basis of the content of the Charter.
2. Level 1 Budget	The budget relied on a Qualifications-Based Selection contract in place at the Floodplain Mapping Program and estimates generated by those contractors.

	Estimates for an IT solution had to be made prior to a requirements analysis to meet the grant application deadline. More time for planning prior to the grant application would have resulted in more reliable estimates. CGIA's experience with review of orthoimagery products was valuable in estimating the quality control aspects of the project.
3. Benefits	Quantification of benefits could have occurred during the grant proposal writing process to strengthen the proposal.
4. Procurement Plan (procurement strategy….build vs. buy)	Planning occurred within the Coordination Program context and engaged expertise from collaborating state agencies.
5. Project Approval Process	The NC 911 Board's grant award to CGIA's client (the City of Durham) was a tacit approval and predated initiation of the Project Approval Process. For future projects generated by grant proposals, CGIA should check to be sure that the proposal includes the key information needed for a sound, approvable project.
6. Managing Sponsor Expectations	CGIA and its collaborating agency partners took time to explain the orthoimagery products and their value to local 911 operations, local GIS operations, and state GIS practitioners to the City of Durham and the NC 911 Board. Details in the proposal and details in explanation of tasks and timetables helped manage expectations.
7. Managing Customer Expectations	CGIA and its collaborating agency partners took time to explain to the grantor, grantee, and stakeholders the value of orthoimagery products to local 911 operations, local GIS operations, and state GIS practitioners. Details in the proposal and details in explanation of tasks and timetables helped manage expectations. Outreach prior to the grant award, outreach after the award and before contracts to county managers and 911 and GIS contacts, and outreach via the NC OneMap website (including FAQ and project status) all helped manage customer expectations.

Planning & Design Phase:

Topic	Lessons Learned
1. Updated Business Case	Engaging the technical advisors (Working Group for Orthophotography Planning) was useful in clarifying the business case for statewide orthoimagery.
2. Updated Budget	The bulk of the project budget ($10.5 million) was for data development under a fixed budget for contractors managed by the Floodplain Mapping Program. The budget for CGIA technical services and an IT solution was approximate in the grant application. Refinement was anticipated after more information about the quality control tasks to be done by a contractor, and after the requirements analysis and IT planning process.
3. Updated Benefits	The benefits analysis used conservative estimates for time savings among users and distributors of orthoimagery. Research on the frequency of data requests and instances of savings of time, money and lives in emergency operations would strengthen the analysis.
4. Managing Customer Expectations	Weekly project team meetings helped communicate plans and expected results
5. Risk Management	Orthoimagery acquisition is weather dependent; the number of days and hours available for leaf-off, snow-free, cloud-free images at permissible sun angles are limited, particularly in areas in the mountains of North Carolina, posing a significant risk for complete statewide acquisition in a single flying season.
6. Issue Management	Weekly project team meetings were valuable in keeping up with project issues related to contractors, communications, and schedules.
7. Monthly Status Reporting	Timely financial reporting and clarity on milestones is needed to convey status effectively.
8. Staffing Plan	The Staffing and Financial Plan workbook was worth the data entry time; the structure and functionality proved invaluable for planning and finding information

	for monthly PPM status reports.
9. Project Schedule / Milestones / Project Planning	More detail on imagery contractor milestones would inform specification of CGIA project team milestones. Contractor milestones for product delivery to CGIA for review were overly optimistic and not met, resulting in a more compressed validation and data distribution schedule for CGIA.
10. Other	Eastern North Carolina has numerous military installations and ranges. The project plan was to gain permission to fly over the military areas, acquire imagery, and publish imagery up to if not including military installations and ranges. This turned out to be a very time consuming, confusing series of communications and uncertainties that affected product delivery and even products in one location. The lesson is that gaining permission to fly over military area through the usual channels is necessary but insufficient. Finding the right contact person for permission to public proved to be the most difficult task of the project. Ultimately, the Governor's Military Liaison made connections that resolved the publication issues. For future phases of this project, a more effective approach may be to request that the Governor's Military Liaison, as early as practical before the flights, engage military contacts who understand the technical issues and have the authority to approve flights over all installations and ranges. The impact of not acquiring all images is missing data over civilian property (as in the vicinity of Harvey Point in Perquimans County, the only location where permission to fly was not granted in 2010; aircraft cannot fly right up to the border of a military area—some civilian areas will necessarily be missed).

Execution & Build Phase:

Topic	Lessons Learned
1. Project Approval Process	Submission as early as practical is important to accommodate review time.
2. Managing Sponsor Expectations	Weekly project team meetings were valuable in clarifying progress toward milestones.
3. Managing Customer Expectations	Weekly project team meetings, including the City of Durham and the NC 911 Board Executive Director, were valuable in understanding and managing expectations.
4. Risk Management	The risk of not acquiring leaf-off, snow-free images in western counties was significant. The contractors mitigated the risk by engaging as many aircraft and digital sensors as practical to take advantage of favorable imagery acquisition conditions. The project team informed the Working Group for Orthophotography Planning of the risk. A subsequent Business Plan for Orthoimagery from the working group recommended a quarter-state annual acquisition that divides the western half of the state in northern and southern quadrants to reduce the risk that too few flight windows will be available.
5. Issue Management	This project did not fit well into the waterfall project concept. The majority of the cost of the project was allocated to data development by private contractors. The data development work started in January 2010 with flights for aerial image acquisition and proceeded through February with delivery of orthoimagery products to CGIA for validation and offline distribution. The work of the contractors, with the exception of a relatively small portion of their time for flight planning, was assigned to the Execution and Build phase. Much of the contractors' work over 14 months occurred in parallel to the Planning and Design phase for the information technology part of the project, a much smaller part of the total cost. The parallel project components (data and IT) created an awkward fit in the structure of the PPM monthly status reports, particularly in terms of schedule and phase costs. These factors made QA review more challenging that it would have been for an IT project without the large data development component.
6. Monthly Status Reporting	The project manager's training in the monthly status reporting tool was minimal because of time constraints early in the project schedule as well as short staffing until November. More time spent on learning the PPM tool and how this specific project fit the concepts would have been beneficial for both data entry and QA review.
7. Project Schedule / Milestones	Imagery contractor milestones were too optimistic for delivery of products to

/ Project Planning	CGIA. The adaption of CGIA's product review and product distribution successfully met milestones, but the compression of tasks posed a potential risk to quality of final products and orientation sessions.
8. Resource Management (internal & external resources)	CGIA relied on internal staff for large parts of the project. Given the small size of the technical staff (5) and the small NC OneMap team (2), some tasks related to responsibilities outside of the project were at risk of delay. Supplemental staff made timely and effective contributions to the product review and final packaging. The drawback to temporary staff is turnover: the vendors offered highly qualified technicians who were attractive to other employers when outside job opportunities arose. All three of the supplemental staff positions had employees leave for other employment before the end of the vendor contracts. Also, the first two supplemental technicians were fast learners and had more than enough training time before the products arrived from the imagery contractors. In this light, the advisable approach is to hold off on start dates for supplemental staff until a backlog of work is clear, and be prepared to work quickly with vendors to find replacements as soon as turnover is evident.
9. Vendor Management / Vendor Performance / Vendor Deliverables	CGIA relied on collaboration with another state agency (Geospatial & Technology Management Office) in vendor management for all private contractors with the exception of the software vendor for NC OneMap and the supplemental technicians. CGIA did not have direct access to the imagery contractors. A more effective arrangement would be for contractors to be managed under CGIA's contract and for CGIA to have direct involvement in weekly contractor meetings. The project team learned that visual quality control should occur in three stages: the first stage is when the processing contractors are ready to send products to the quality control contractor; the processing contractor should be sure to look at large areas (many tiles) for consistent color balance and other visual quality issues that are not apparent looking at a few tiles at a large scale. The second stage is the quality control contractor. Again, viewing multiple tiles together (small scale) may reveal systematic color balance issues or misplaced tiles. The third stage is CGIA's validation. At that stage, review and issue resolution will be less time consuming if any systematic, widespread issues have been identified and resolved at stage 1 or 2.
10. Project Communication	Weekly project team meetings were invaluable for tracking progress and resolving issues. The project team could have made more use of the SharePoint tool for sharing key geospatial data files early in the project (county boundaries, tile indexes, and metadata templates) instead of relying on email attachments from state agency to state agency. The tool was used successfully later in the project.
11. Pilot	The pilot areas (four in each region) for orthoimagery sample products were valuable in providing specific guidance on color balancing expectations to the contractors.
12. Development / Build	CGIA modified a previous Standard Operating Procedure for review of orthoimagery to fit the requirements of this project, including copying and reviewing 100 county packages of data. For efficiency and accuracy purposes, CGIA developed custom desktop tools to semi-automate tasks to validate, copy, select, review and report on imagery files. The time spent up front resulted in more efficient review and more confidence in results, which was valuable given the compressed schedule for review and distribution.
13. Testing (test execution, verification & validation, test scripts, test cases)	CGIA tested the desktop tools efficiently with comparable imagery products from a sample county from a previous year.
14. Requirements Verification & Validation	On the topic of requirements for the imagery contractors, the project team learned that a set of specific, graphic examples of visual quality expectations would be valuable in communicating visual quality requirements to the contractors. This project generated many examples of visual quality issues that could have been resolved by contractors before the visual QC stage.
15. Hosting Provider (setting up environments)	ITS hosting required detailed Technical Architecture System Design and Client Questionnaire information that proved valuable in proceeding efficiently when the project was ready to begin paying for hosting services.
16. Backup / DR Strategy	ITS hosting was helpful in developing a back-up strategy for what is a snap shot of North Carolina—once the data are loaded on a server, the data will not change until another year's products are developed. Given the significant cost of backing up a physical server with 6.8 TB of usable disk space, the strategy interrupts back-

	ups for many months until needed.

Implementation Phase:

Topic	Lessons Learned
1. Managing Sponsor Expectations	Weekly project team meetings and periodic meetings with the NC OneMap staff were valuable in clarifying expectations and timetables for elements of implementation.
2. Managing Customer Expectations	Face-to-face product orientation sessions proved to be effective in managing the expectations of the county data recipients. In 26 meetings with clusters of 3-5 counties, CGIA explained the technical details of the products, including expectations for visual quality. This paid off during the counties' 90-day review period; county submissions of issues were mostly consistent with the quality expectations stated and illustrated in the orientation sessions. CGIA learned that minimizing procurement early in the project by assuming that one portable drive per county (and requisite data sharing within a county) led to dissatisfaction among some of the Public Safety Answering Point contacts. CGIA procured additional portable drives and distributed them to 25 non-county PSAPs. Next time, the procurement plan will accommodate all primary PSAPs. CGIA promoted use of new "image service" data on NC OneMap early in the project. Users tend to be oriented toward having copies of imagery files in hand, but CGIA's new image service functionality is satisfying some of those users and reducing the offline distribution of datasets. Some state agencies that have field workers with mobile mapping devices still require loaded imagery in locations of poor Internet access, but the image service feature of NC OneMap performs well for users with good online connections.
3. Risk Management	Obtaining permission to public imagery captured over or adjacent to military installations and ranges was a more significant risk that anticipated. A meeting of military representatives in February, led by the Executive Director of the 911 Board, resulted in resolutions for all installations and ranges. In the future, engagement of the Governor's Military Liaison earlier in the project would reduce the risk.
4. Issue Management	Significant time is needed by a project manager to enter data and check for consistency between the Staffing and Financial Plan and the Cost Tracking table in the PPM tool. More frequent milestones (representing intermediate project elements) are informative for project status review and for stating accomplishments.
5. Monthly Status Reporting	Status reports to CGIA's client (Durham and NC 911 Board) and monthly status reports used the same statements of accomplishments for consistency and efficiency.
6. Project Schedule / Milestones / Project Planning	Lessons learned about the level of internal effort needed by the NC OneMap team will be integrated in project planning and milestone definition in subsequent phases of the project.
7. Resource Management (internal & external resources)	Keeping track of data products, quality issues, and distribution of products for 100 counties requires a significant amount of project management time. Internal tools for tracking proved to be valuable in saving time and assuring consistency.
8. Vendor Management / Vendor Performance / Vendor Deliverables	Procuring a package of training, configuration, and customization of the Geoportal server software from Esri was essential in implementing the NC OneMap Geospatial Portal on time and with expected quality. Esri accommodated the projects schedule and requirements effectively and on schedule.
9. Project Deliverables (refer to the list of deliverables in the PPM Tool that the PM said would be delivered)	The project deliverables included the imagery products for offline delivery to counties. The time span for packaging the portable drives was longer than planned for two reasons: (1) assembling a county of interest plus all of its adjacent counties required waiting until the entire cluster of counties had complete, approved products; excluding the neighboring counties would have accelerated the delivery process, but counties confirmed that value of having adjacent county imagery for computer aided dispatch systems; and (2) creating compressed mosaics (compilation of all tiles in a county) required long processing times, and, with mosaics being part of the initial packaging, extended the time needed for county packages to be complete. One other note about mosaics: several counties

	inquired about a higher compression ratio for mosaic sets for disk storage and distribution reasons. A compression ratio of 100:1 instead of the selected ratio of 50:1 should be considered in future projects.
10. Hosting Provider	ITS Hosting Services provided a reliable, predictable platform for the implementation. Direct access to the server for loading compressed imagery files was essential for maintaining a timely workflow for data loading and image service creation.
11. Production Readiness (software / hardware, process, personnel)	Production readiness included training in conjunction with configuration of the geoportal software was timely. The training and technical assistance was intended to be weeks before implementation (but was delayed by a vendor personnel complication). Ideally, the services would be delivered 4-6 weeks before the implementation milestone date.
12. Other	This project engaged a collaborative project team across state agencies that proved to be successful and valuable. In addition to the participants under contract to the City of Durham (NC 911 Board, CGIA, and GTM) and indirectly to GTM (DENR), the state's coordination program provided expertise (the Statewide Mapping Advisory Committee's Working Group for Orthophotography Planning), an online platform (nconemap.gov), methods for communication (GIS user committees, list serves, websites) and opportunities for outreach (annual meeting and workshops). The time spent on collaboration, technical advice, communication and outreach paid off in the spring and summer of 2011 when statewide users readily accepted, installed and used the new imagery products, and willingly provided feedback on products and services.

Exhibit C

CCPS - VIPER Strategic Solution Implementation Project – Phase 1

Initiation Phase:

Topic	Lessons Learned
1. Procurement Plan (procurement strategy….build vs. buy)	The project team learned that our best approach is to buy instead of build what we need due to the lack of support personnel, especially if the grant funds will support the purchase
2. Managing Customer Expectations	It's been beneficial to have field staff involved with the local customers to manage their expectations of sites they're interested in

Implementation Phase:

Topic	Lessons Learned
1. Project Approval Process	The project took a while to get to this phase due to the lack of documentation requested by the Agency CIO. This issue was eventually resolved.
2. Managing Customer Expectations	Local customers asked the field staff for updates to the sites they were interested in. At times the office staff in Raleigh would receive calls and emails asking for status of certain sites. Unfortunately, monthly status updates are not feasible with the current number of staff we have in the office and the number of different sites being implemented simultaneously.
3. Risk Management	We did not run into any huge risks that could not be mitigated in a timely fashion. There was no way of knowing that Roanoke Rapids would be at risk for being stopped by the State Historic Preservation Office until we started the environmental process at the site. There was no way of knowing that the site maybe a problem with SHPO to start it earlier.
4. Monthly Status Reporting	I probably need to try and start the monthly status reporting earlier than the week of but finding time to start earlier is a problem.
5. Project Schedule / Milestones / Project Planning	Though we have had 2 change requests involving a schedule extension, there was no way to account for obstacles that come up during site implementation to

	account for the delays.
6. Project Deliverables (refer to the list of deliverables in the PPM Tool that the PM said would be delivered)	The deliverables which in this case equate to the number of sites to be constructed are dictated by the amount of funding received. We cannot turn away funding to build VIPER and have no option but to plan and build as many sites as possible with the funds.

Exhibit D

DOI - SHIIP's Information Technology Services (SITS)

What areas were done well
a. Flexibility from IT staff was critical to project success.
b. Communication was clear from IT to business unit and clarified technical jargon to avoid confusion
c. IT and business unit staff maintained great availability
d. IT staff went above & beyond in creativity options to meet business needs
e. Business unit performed testing executed when requested and in timely manner
f. Business unit clear on business needs & goals

Do better
a. Virtual meeting space would be of great assistance when dealing with remote trainees and current system not clearly available or trained on.
b. Document review clearer/cleaner for output reports.